

### REMARKS

Claims 1-3, 12-13, 26, 27, 31-33, and 37-39 are pending.

#### Rejection under 35 U.S.C. § 112, second paragraph

The Examiner has rejected claims 1-3, 12-13, 26-27, 31-33 and 37-39 under 35 U.S.C. § 112, second paragraph for being indefinite (See Office Action at 4). Claims 1, 26 and 37 are independent.

Claims 1, 26 and 37 each relate to libraries wherein each member in the library is bound to an individual support, each support having associated therewith more than one population of semiconductor nanocrystals, each population having a distinct characteristic spectral emission, wherein each nanocrystal includes a Group II-VI semiconductor, a Group III-V semiconductor, a Group IV semiconductor, or an alloy of ZnS, ZnSe, ZnTe, CdS, CdSe, CdTe, HgS, HgSe, HgTe, MgTe, GaN, GaP, GaAs, GaSb, InN, InP, InAs, InSb, AlAs, AlP, AlSb, AlS, Ge, Si, or Pb.

The Examiner contends that “the present claim language is indefinite (i.e. explanation of record is not clarified in the present claim language).” See Office Action at 5. Applicants respectfully disagree. The claim language states that each member in the library (each library member) is bound to an individual support, each support having associated therewith more than one population of semiconductor nanocrystals (i.e., at least two populations of semiconductor nanocrystals), each population having a distinct characteristic spectral emission. Each library member is associated with a population of semiconductor nanocrystals with a characteristic spectral emission wherein each semiconductor nanocrystal in the population has the same characteristic spectral emission, and also with at least one other population of semiconductor nanocrystals with a characteristic spectral emission distinct from that of the other population. Each library member is associated with an aggregate spectral emission composed of the characteristic spectral emissions of more than one population of semiconductor nanocrystals. Furthermore, semiconductor nanocrystals are not part of the support but they are associated with it.

Applicants respectfully request reconsideration and withdrawal of this rejection.

Rejection under 35 U.S.C. § 102(e)

The Examiner continues to reject claims 1, 3, 12-13, 26-27, 32, 33, 37 and 39 under 35 U.S.C. § 102(e) as being anticipated by U.S. Patent No. 6,096,496 to Frankel ("Frankel") (see Office Action at 5). The Examiner argues Frankel teaches "a bead (100) surrounding a substrate (190) with ID tags (120) which may be encapsulated (125) and comprises molecular anchoring sites (130a-c) with oligomeric compounds attached (165a-c) directly associated with the bead" (see Office Action at 6). Applicants respectfully disagree. Claim 1, 26 and 37 are independent.

Claim 1 relates to a library of compounds, wherein each compound in the library is bound to an individual support, each support having associated therewith more than one population of semiconductor nanocrystals, each population having a distinct characteristic spectral emission, wherein each nanocrystal includes a Group II-VI semiconductor, a Group III-V semiconductor, a Group IV semiconductor, or an alloy of ZnS, ZnSe, ZnTe, CdS, CdSe, CdTe, HgS, HgSe, HgTe, MgTe, GaN, GaP, GaAs, GaSb, InN, InP, InAs, InSb, AlAs, AlP, AlSb, AlS, Ge, Si, or Pb.

Claim 26 relates to a chemical library including a plurality of member chemicals, wherein each member chemical is bound to a support, each support having associated therewith more than one population of semiconductor nanocrystals, each population having a distinct characteristic spectral emission, wherein each nanocrystal includes a Group II-VI semiconductor, a Group III-V semiconductor, a Group IV semiconductor, or an alloy of ZnS, ZnSe, ZnTe, CdS, CdSe, CdTe, HgS, HgSe, HgTe, MgTe, GaN, GaP, GaAs, GaSb, InN, InP, InAs, InSb, AlAs, AlP, AlSb, AlS, Ge, Si, or Pb..

Claim 37 relates to a library of polypeptides including a plurality of polypeptides, wherein each polypeptide in the library is bound to an individual support, each support having associated therewith more than one population of semiconductor nanocrystals, each population having a distinct characteristic spectral emission and wherein each nanocrystal includes a Group II-VI semiconductor, a Group III-V semiconductor, a Group IV semiconductor, or an alloy of ZnS, ZnSe, ZnTe, CdS, CdSe, CdTe, HgS, HgSe, HgTe, MgTe, GaN, GaP, GaAs, GaSb, InN, InP, InAs, InSb, AlAs, AlP, AlSb, AlS, Ge, Si, or Pb.

Frankel describes beads transmitting a distinct electromagnetic code. Firstly, the Examiner contends that "Frankel teaches ID tags forming a distinct combination code for each bead (i.e. multiple spectral emissions) including various semiconductors" (see Office Action at

7). However, Frankel makes no mention of semiconductor nanocrystals. Accordingly, Frankel does not anticipate claims 1, 26 and 37, each of which relates to a library of compounds with more than one population of semiconductor nanocrystals.

The Examiner contends that silica is a Group IV semiconductor nanocrystal. See Office Action at 6. Applicants respectfully disagree. While a Group IV semiconductor nanocrystal can include silicon, Frankel refers to silica, i.e., silicon oxide, which is not a Group IV semiconductor nanocrystal. Additionally, the mention of silica does not describe a Group IV semiconductor nanocrystal.

Additionally, the Examiner implies that an "electromagnetic spectrum emitter" is a semiconductor nanocrystal. See Office Action at 6-7. Applicants respectfully disagree. The group designation of electromagnetic spectrum emitter is too broad to suggest a particle form of emitter, such as a semiconductor nanocrystal. A person of ordinary skill in the art would not understand that an electromagnetic spectrum emitter refers specifically to a semiconductor nanocrystal.

Furthermore, the Examiner contends that Frankel teaching "multiple ID tags forming a distinct combination code for each bead (i.e. multiple spectral emissions) including various semiconductor nanocrystals," (see Office Action at 7) is sufficient to teach semiconductor nanocrystals of Group II-VI semiconductor, a Group III-V semiconductor, a Group IV semiconductor, or an alloy of ZnS, ZnSe, ZnTe, CdS, CdSe, CdTe, HgS, HgSe, HgTe, MgTe, GaN, GaP, GaAs, GaSb, InN, InP, InAs, InSb, AlAs, AlP, AlSb, AlS, Ge, Si, or Pb are taught. Applicants respectfully disagree. Frankel does not teach semiconductor nanocrystals and the mention of multiple ID tags forming a distinct combination code does not anticipate a semiconductor nanocrystal of Group II-VI semiconductor, a Group III-V semiconductor, a Group IV semiconductor, or an alloy of ZnS, ZnSe, ZnTe, CdS, CdSe, CdTe, HgS, HgSe, HgTe, MgTe, GaN, GaP, GaAs, GaSb, InN, InP, InAs, InSb, AlAs, AlP, AlSb, AlS, Ge, Si, or Pb.

The Examiner contends that Frankel describes the "ID tag is fabricated on substrate 190" (see Frankel, col. 13, line 22), and that "[g]lass or plastic encapsulate 125 is formed over, or at least secured over, ID tag 120 after the fabrication of the ID tag is completed" (see Frankel, col. 13, lines 36-38). In the device described by Frankel, the substrate is directly associated to the ID tag. In the instant claims, substrate is first associated with a support, and the support is

associated with more than one population of semiconductor nanocrystals, each population having a distinct characteristic spectral emission (see specification, page 29, lines 1-11 and Figure 5). Frankel does not anticipate claims 1, 26 and 37 because Frankel does not describe a substrate is first associated with a support and associated with more than one population of semiconductor nanocrystals, each population having a distinct characteristic spectral emission.

The Examiner contends that the above argument "appears to rely on the method of making the library of compounds. However, the present invention is drawn to a product." See Office Action at 7. Applicants respectfully disagree. The argument is used to show that Frankel does not enable a person of ordinary skill in the art to make the product of the instant claims because the products are inherently different.

The Examiner contends that Frankel discloses "tag systems described [as] semiconductor nanocrystals (i.e. nanoparticles; see column 18, lines 28-32). Applicants respectfully disagree. The nanoparticles of Frankel are not semiconductor nanocrystals. Firstly, the nanoparticles scatter light (see Frankel at col. 18, line 33), whereas semiconductor nanocrystals emit light. Importantly, Frankel mentions nanoparticles and not specifically nanocrystals. A person of ordinary skill in the art knows that a nanoparticle is distinct from a nanocrystal. Additionally, Frankel discloses nanoparticles in the 30-300 nm size range. See Frankel at col. 18, lines 32-33. The size of the semiconductor nanocrystal is preferably 12 to 150 Å (see specification at p. 15, lines 1-2), which is the equivalent of 1.2-15 nm. The semiconductor nanocrystals of the instant specification are much smaller than the nanoparticles disclosed by Frankel.

The Examiner has failed to show that Frankel teaches every element of the instant claims. "A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference." *Verdegaal Bros. v. Union Oil Co. of California*, 814 F.2d 628, 631, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987). MPEP 2131. Accordingly, claims 1, 26 and 37, and the claims which depend therefrom are not anticipated by Frankel. Applicants respectfully request reconsideration and withdrawal of this rejection.

#### Rejection under 35 U.S.C. § 103(a)

##### Frankel in view of Dabbousi

The Examiner has rejected claims 1-3, 12-13, 26-27, 31-33 and 37-39 under 35 U.S.C. §

103(a) as being unpatentable over Frankel in view of Dabbousi et al., 1997, (CdSe)ZnS Core-Shell Quantum Dots: Synthesis and Characterization of a Size Series of Highly Luminescent Nanocrystallites, *J. Phys. Chem. B*, 101:9463-9475 ("Dabbousi") (see Office Action at 8). Applicants respectfully disagree. Claims 1, 26 and 37 are independent.

As previously discussed, Frankel does not teach or suggest libraries wherein each member in the library is bound to an individual support, each support having associated therewith more than one population of semiconductor nanocrystals, each population having a distinct characteristic spectral emission, wherein each nanocrystal comprises a Group II-VI semiconductor, a Group III-V semiconductor, a Group IV semiconductor, or an alloy of ZnS, ZnSe, ZnTe, CdS, CdSe, CdTe, HgS, HgSe, HgTe, MgTe, GaN, GaP, GaAs, GaSb, InN, InP, InAs, InSb, AlAs, AlP, AlSb, AlS, Ge, Si, or Pb, as described in claims 1, 26 and 37.

Dabbousi does not supply these omissions. Dabbousi describes the synthesis of highly luminescent CdSe(ZnS) (core/shell) composite quantum dots (see Dabbousi, Abstract). Dabbousi does not teach or suggest libraries wherein each member in the library is bound to an individual support, each support having associated therewith more than one population of semiconductor nanocrystals, each population having a distinct characteristic spectral emission, wherein each nanocrystal comprises a Group II-VI semiconductor, a Group III-V semiconductor, a Group IV semiconductor, or an alloy of ZnS, ZnSe, ZnTe, CdS, CdSe, CdTe, HgS, HgSe, HgTe, MgTe, GaN, GaP, GaAs, GaSb, InN, InP, InAs, InSb, AlAs, AlP, AlSb, AlS, Ge, Si, or Pb, as described in claims 1, 26 and 37.

Additionally, applicants submit that the Examiner is relying on hindsight to reach this obviousness determination. The Federal Circuit has stated in W.L. Gore & Associates, Inc. v. Garlock, Inc., 220 USPQ 303 (Fed. Cir. 1983) that "[t]o imbue one of ordinary skill in the art with knowledge of the invention in suit, when no prior art reference or references of record convey or suggest that knowledge, it to fall victim to the insidious effect of a hindsight syndrome wherein that which only the inventor taught is used against its teacher." *Id.*, at 312-13. It is essential that "the decisionmaker forget what he or she has been taught at trial about the claimed invention and cast the mind back to the time the invention was made...to occupy the mind of one skilled in the art who is presented only with references, and who is normally guided by the then-accepted wisdom in the art." *Id.*, at 313. The mere fact that references can be combined or

modified does not render the resultant combination obvious unless the reference also suggests the desirability of the combination. *See* MPEP 2143.01 (citing *In re Mills*, 916 F.2d 680 (Fed. Cir. 1990)). In other words, it is legal error for the Examiner to use hindsight reconstruction to pick and choose among isolated disclosures in the cited references to deprecate the claimed invention. A person of ordinary skill in the art would not combine the identification tagging apparatus of Frankel with the semiconductor nanocrystals of Dabbousi to make the library of the instant claims.

Neither Frankel nor Dabbousi, alone or in combination, teach, suggest, or motivate a person of ordinary skill in the art to form the libraries described in the instant claims. Claims 1, 26, 37 and any claims that depend therefrom are not obvious over Frankel in view of Dabbousi.

#### Frankel in view of Weiss

The Examiner has rejected claims 1-3, 12-13, 26-27, 31-33 and 37-39 under 35 U.S.C. § 103(a) as being unpatentable over Frankel in view of U.S. Patent No. 6,927,069 to Weiss et al. ("Weiss"). (see Office Action at 8). Applicants respectfully disagree. Claims 1, 26 and 37 are independent.

As previously discussed, Frankel does not teach or suggest libraries wherein each member in the library is bound to an individual support, each support having associated therewith more than one population of semiconductor nanocrystals, each population having a distinct characteristic spectral emission, wherein each nanocrystal comprises a Group II-VI semiconductor, a Group III-V semiconductor, a Group IV semiconductor, or an alloy of ZnS, ZnSe, ZnTe, CdS, CdSe, CdTe, HgS, HgSe, HgTe, MgTe, GaN, GaP, GaAs, GaSb, InN, InP, InAs, InSb, AlAs, AlP, AlSb, AlS, Ge, Si, or Pb, as described in claims 1, 26 and 37.

Weiss does not supply these omissions. Weiss describes a luminescent semiconductor nanocrystal compound capable of linking to an affinity molecule to form an organo luminescent semiconductor nanocrystal probe (see Weiss, col. 2, lines 22-25). Weiss does not teach or suggest libraries wherein each member in the library is bound to an individual support, each support having associated therewith more than one population of semiconductor nanocrystals, each population having a distinct characteristic spectral emission, wherein each nanocrystal comprises a Group II-VI semiconductor, a Group III-V semiconductor, a Group IV

Applicant : Mouni G. Bawendi et al.  
Serial No. : 10/632,922  
Filed : August 4, 2003  
Page : 12 of 12

Attorney's Docket No.: 14952.0274 C1D1/ MIT Case 8096

semiconductor, or an alloy of ZnS, ZnSe, ZnTe, CdS, CdSe, CdTe, HgS, HgSe, HgTe, MgTe, GaN, GaP, GaAs, GaSb, InN, InP, InAs, InSb, AlAs, AlP, AlSb, AlS, Ge, Si, or Pb, as described in claims 1, 26 and 37.

Neither Frankel nor Weiss, alone or in combination, teach, suggest, or motivate a person of ordinary skill in the art to form the libraries described in the instant claims. Claims 1, 26, 37 and any claims that depend therefrom are not obvious over Frankel in view of Weiss.

### CONCLUSION

In light of the foregoing amendments and remarks, Applicants respectfully submit that all requirements for patentability are met and ask that all claims be allowed. Please apply any charges or credits to deposit account 19-4293.

Respectfully submitted,

Date: 4-23-10



Harold H. Fox  
Reg. No. 41,498

STEPTOE & JOHNSON LLP  
1330 Connecticut Avenue, NW  
Washington, DC 20036-1795  
Phone: 202-429-3000  
Fax: 202-429-3902